



**Naval Facilities Engineering Command Southwest
BRAC PMO West
San Diego, CA**

AIR MONITORING SUMMARY REPORT

APRIL 13 TO APRIL 26, 2019

Remedial Action/Non-Time-Critical Removal Action Installation
Restoration Site 12

FORMER NAVAL STATION TREASURE ISLAND, SAN
FRANCISCO, CA

May 2019

Approved for public release; distribution is unlimited

DCN: GLBN-0005-4239-028



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FRANCISCO, CA

Prepared for:



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LIST OF ABBREVIATIONS AND ACRONYMS

4,4'-DDD	4,4-dichlorodiphenyldichloroethane
AMP	Air Monitoring Plan
BAAQMD	Bay Area Air Quality Management District
BAP	benzo(a)pyrene
cfm	cubic feet per minute
CFR	Code of Federal Regulations
DAC	derived air concentration
DTSC	Department of Toxic Substances Control
HERO	Human and Ecological Risk Office
Gilbane	Gilbane Federal
DCP	Dust Control Plan
IR	Installation Restoration
mg/m ³	milligram per cubic meter
Navy	U.S. Department of the Navy
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PDR	personal data-logging real-time aerosol monitor
PM10	particulate matter less than 10 microns in diameter
PUF	polyurethane foam
Ra-226	radium-226
TCDD	2,3,7,8-tetrachlorodibenzo-p-dioxin
TLV	threshold limit value
TSP	total suspended particulates
µg/m ³	microgram per cubic meter
USEPA	United States Environmental Protection Agency
Work Plan	<i>Final Work Plan, Remedial Action/Non-Time Critical Removal Action, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California</i>

1.0 INTRODUCTION

This Air Monitoring Report was prepared by Gilbane Federal (Gilbane) as requested by the United States Department of the Navy (Navy) under the Radiological Multiple Award Contract (RADMAC II) N62473-12-D-D005, Contract Task Order F4239. Gilbane is performing dust and air monitoring at Former Naval Station Treasure Island in accordance with the Final Dust Control Plan (DCP) and Air Monitoring Plan (AMP), included as appendices to *Remedial Action/Non-Time Critical Removal Action Work Plan, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California* (Work Plan; Gilbane, 2018).

The DCP describes best management practices and procedures to be implemented to minimize dust generation during work activities. Dust monitoring is conducted to ensure that these procedures are effective. Dust monitoring is also conducted to verify that the working environment meets occupational health and safety standards and that workers are safe. The AMP outlines the requirements for prevention of exposure for construction workers to dust and potential airborne chemicals of concern from the work area. The AMP also establishes the conservative project action levels for dust at the work area boundary to protect residents.

This summary report describes the following:

- Dust and air monitoring sampling locations – **Section 2.0**;
- Dust and air monitoring sample collection and analytical methods – **Section 3.0**;
- Dust and air monitoring data – **Section 4.0**; and
- Dust and air monitoring results – **Section 5.0**.

This summary report presents the dust and air monitoring test results at Installation Restoration (IR) Site 12 and/or IR Site 32 from April 13th, 2019 through April 26th, 2019, and compares the results with the established action levels included in the Work Plan (Gilbane, 2018).

IR Site 32, located 600 yards to the east of IR Site 12, is being used as a radiological screening yard and staging yard for the IR Site 12 project activities. The screening criteria established for IR Site 12 will be applied to the air monitoring at IR Site 32.

During the reporting period, personal data-logging real-time aerosol monitoring (PDR) dust data was collected. Air samples were collected and analyzed for lead, chromium, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), dioxin [2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD)], total suspended particulates (TSP), and particulate matter less than 10 microns in diameter (PM10). In addition, air samples were analyzed for radiological gross alpha and beta levels.

2.0 MONITORING SITE LOCATIONS

2.1 Dust Monitoring

During earthmoving activities, multiple PDR stations are set up to monitor real-time airborne dust concentrations. The purpose of the PDR stations is to act as a first line of defense in protecting workers' health, and ultimately the public's health, during field activities. Dust levels are monitored at, and immediately adjacent to, the work area at the locations that will most likely contain the greatest volume of airborne dust. The objective of this dust monitoring approach is to demonstrate that dust levels are below action levels.

The general locations for dust monitors in IR Site 32 are shown on Figure 1, and the general locations for dust monitors for IR Site 12 are shown on Figure 2. Specific locations of each PDR are described in the individual PDR daily data files. Field forms from each location are presented in Attachment 1 of this report. During earth moving activities (i.e. transporting soil to radiological screening yard pads, managing radiological screening yard pads, etc.) at IR Site 32, one PDR serves as the upwind (background) location and two PDRs are placed in downwind perimeter locations. Correspondingly, during earth moving activities at IR Site 12 (i.e., transportation of excavated soil to the radiological screening yard, excavation, and backfilling), one PDR serves as the upwind (background) location and two PDRs are placed in downwind perimeter locations. Weather forecasts including wind direction are checked daily with a weather station located at Building 572.

2.2 Air Monitoring

Air monitoring samples were collected at the upwind Perimeter Road location and at the downwind location at the gate to Site 32. Air monitoring samples collected using high volume samplers are collected to identify and quantify airborne contaminants and to confirm the results recorded during dust (PDR) monitoring. Air monitoring stations are mobilized to collect air monitoring samples upwind and downwind of work areas. General locations of air monitoring stations are shown on Figure 3. The locations of the air monitoring stations are determined based on the prevailing wind direction (typically

from the northwest) and are modified as needed. A weather station is erected to monitor the wind direction.

High volume air monitoring stations remain stationary while sampling is being conducted; however, locations may be adjusted when the wind direction changes and when overall excavation work areas change from one site to another. Each upwind and downwind high volume monitoring station includes separate monitoring systems for the following:

- TSP- collected daily
- PM10- collected daily
- Lead and chromium- collected daily
- PAHs, PCBs, and Dioxins- collected on alternating days

2.3 Radiological Air Monitoring

Radiological air samplers are positioned adjacent to excavation work activities for radiologically impacted soil at one upwind and one downwind location during earthmoving activities associated with radiologically impacted soil. The radiological air samplers may be co-located with PDRs or the high-volume samplers.

3.0 SAMPLING AND ANALYTICAL METHODS

Dust and air samples are collected during earthmoving activities. However, during precipitation events, the dust and air monitoring units may not be operable. An attempt will be made to collect samples and readings regardless of the weather. If dust or air monitors are found to be malfunctioning or nonfunctional, earthmoving activities will stop until monitors can be repaired or replaced. The Site Health and Safety Officer is responsible for monitoring the air and dust monitoring sampling equipment. In rare cases, due to ancillary equipment malfunction such as generator failure during the night, a sample may be collected that represents a period of less than 24 hours. If this situation occurs, a note is added to the sample result data tables indicating why the full sampling period was not achieved.

3.1 Dust Samples

The PDR is a high sensitivity photometric monitor with a light-scattering sensing configuration that has been optimized for the measurement of the respirable fraction of airborne dust, smoke, fumes, and mists.

PDRs are used to evaluate real-time monitoring of airborne dust concentrations, to determine if there is a need for additional dust control or personal protection.

3.2 Air Samples

Air samples were sampled in accordance with the United States Environmental Protection Agency (USEPA) reference sampling method for PM₁₀, described in 40 Code of Federal Regulations (CFR) 50, Subpart J. Each sample was collected on a filter over an approximately 24-hour period; the filter was then weighted to determine the amount of PM₁₀ collected.

TSP samples were collected with a high-volume (39 to 60 cubic feet per minute [cfm]) air sampler in accordance with USEPA's reference sampling method for TSP, described in Title 40 CFR, Part 50, Subpart B. Each sample was collected on a filter over an approximately 24-hour period; the filter was then weighed to determine the amount of TSP collected. Once the filter weight was determined, the sample was analyzed for lead and chromium in accordance with USEPA Method 6020 using inductively coupled mass spectrometry.

Air samples for PCBs, PAHs, and dioxins are collected and analyzed in accordance with USEPA Methods TO-4A, TO-13, TO-9A, respectively, using TISH polyurethane (PUF) samplers. The filter media collected from the air samplers is submitted to the analytical laboratory for appropriate analysis.

PCB, PAH, and dioxin samples are collected on alternating days at the downwind and upwind stations during earthmoving activities.

3.3 Radiological Air Samples

Radiological air monitoring is also conducted upwind and downwind on days of earthmoving activities. Radiological samples are collected with a LV-1 low volume air sampler. Air filters are counted on site following a decay period and are compared with public air concentration limits published in 10 CFR Part 20. Radiological air sampling methods and procedures are detailed in Gilbane Radiological Procedure PR-RP-150 *Radiological Survey and Sampling*.

The radiological air sample is counted on a Low Background Protean WPC-9950 and analyzed for gross alpha and beta activity. The calculated airborne concentration in microcuries is then compared to the effluent concentration (often but incorrectly refer to as a derived air concentration [DAC] which applies only to occupational exposures) limit specified in Table 2 of Appendix B to 10 CFR 20. The effluent

concentration is the concentration of a given radionuclide in air which, if inhaled continuously over the course of a year, results in an exposure equal to the annual regulatory limit specified in 10 CFR 20.1302. The threshold for radiological effluent air monitoring samples is 10 percent of the effluent concentration, which ensures work practices are evaluated and modified as necessary to ensure the limit is not reached.

4.0 DUST AND AIR MONITORING DATA

The Human and Ecological Risk Office (HERO) at the request of the California Department of Toxic Substances Control (DTSC) developed dust action levels for community air monitoring for IR Site 12. Subchronic and chronic dust action levels as PM₁₀ were calculated for lead, chromium, dioxin, benzo(a)pyrene (BAP), 4,4-dichlorodiphenyldichloroethane (4,4'-DDD) and PCBs. As presented in the document *Dust Action Levels for Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California* (HERO, 2018), the action levels were calculated using the maximum chemicals of concern soil concentrations at IR Site 12. As noted in **Section 1.0**, IR Site 12 action levels will be implemented for project work at IR Site 32.

Based on HERO's recommendations, a PM₁₀ dust action level of 50 microgram per cubic meter (ug/m³) will be implemented for all excavations areas at IR Site 12 except at the area surrounding sampling location KCH-1217-1 which will have a limit of 8 ug/m³ due to the elevated level of contaminants historically measured at this location. TSP is expected to be further controlled based on the limit employed for PM₁₀, in accordance with guidance provided by the San Francisco Bay Area Air Quality Management District (BAAQMD), which estimates that PM₁₀ makes up approximately 55 percent of TSP. If it is apparent that project activities are the cause of exceedances, additional control measures will be considered and implemented.

Dust monitoring action levels that are implemented on a real-time basis are listed in Table 1. PDR data are collected and reviewed each day by the Site Health and Safety Manager. PDR data are included in Attachment 1.

Analytical results from air monitoring samples are compared with the project screening criteria (threshold limit values [TLV]) listed in Table 2. Air monitoring results are included in Attachment 2. Radiological monitoring results are included in Attachment 3.

Table 1
Dust Monitoring Project Action Levels

Method	Monitoring Location	Monitoring Frequency ^a	Action Level ^b	Action
PDR	Near Workers' Breathing Zones (typically on equipment)	Periodically ^c	<2.5 mg/m ³ >2.5 mg/m ³	Continue work. Use Level D and increase dust control (i.e., apply water or other suppression method). Optionally upgrade to Level C until concentrations are reduced.
	Job Site Perimeter	Continuously	<1.0 mg/m ³ >1.0 mg/m ³	Continue work. Increase dust control and re- evaluate. Stop work if levels do not decrease.

Notes:

Only the Health and Safety Manager is authorized to downgrade levels of personal protective equipment.

^a Frequency of air monitoring may be adjusted by the project Certified Industrial Hygienist after sufficient characterization of site contaminants has been completed, tasks have been modified, or site controls have proven effective.

^b Five readings exceeding the action level in any 15-minute period or a sustained reading exceeding the action level for five minutes will trigger a response. Action levels represent airborne particulate concentrations in excess of background particulate concentrations.

^c PDR will be monitored a minimum of three times a day.

< less than

> greater than

mg/m³ milligram per cubic meter

PDR personal data-logging real-time aerosol monitor

Table 2
Air Monitoring Project Screening Criteria

Chemicals of Concern	Project Screening Criteria (Threshold Limit Value) $\mu\text{g}/\text{m}^3$	Basis
Lead	242	TI Site 12 Dust Action Level
Chromium	929	TI Site 12 Dust Action Level
TSP	50	TI Site 12 Dust Action Level
PM10	50	BAAQMD ambient air quality
BAP	50 (8) ^b	TI Site 12 Dust Action Level
PCBs ^a	NA	TI Site 12 Dust Action Level
4,4'-DDD	200	TI Site 12 Dust Action Level
Dioxin ^a	1E+07	TI Site 12 Dust Action Level
Radiological (Ra-226)	10% of DAC ^c	Occupational and public air concentration limits for Ra-226 published in 10 Code of Federal Regulations Part 20.

Notes:

a The dust action level was increased by a factor of 10 to account for the short-term duration of the project relative to the lifetime assumptions incorporated into the toxicity criteria and exposure assumption.

b BAP action levels will be 50 $\mu\text{g}/\text{m}^3$ for all excavations except for the area surrounding sample locations KCH-1217-1 at which it will be 8 $\mu\text{g}/\text{m}^3$

c Public air concentration limits are commonly referred to as DAC, but are in actuality Effluent Concentrations from Table 2 for 10 CFR Part 20.

% percent

4,4'-DDD dichlorodiphenyldichloroethane

BAAQMD Bay Area Air Quality Management District

BAP benzo(a)pyrene

DAC derived air concentration

PCBs polychlorinated biphenyls

PM10 particulate matter smaller than 10 microns in diameter

Ra-226 radium-226

TSP total suspended particulates

$\mu\text{g}/\text{m}^3$ microgram per cubic meter

5.0 AIR MONITORING RESULTS

If dust (PDR) monitoring equipment alarm, the source of exceedance will be determined by evaluating both upwind and downwind dust (PDR) sample locations. If the difference between upwind and downwind concentrations is greater than the action level for a sustained period of 15 minutes, then earthmoving activities will be halted until dust control measures are implemented. These may include, but are not limited to adding water to the work area during earth moving tasks, evaluation of alternate work procedures or equipment, and/or cessation of the activity that is creating the dust until the PDR readings are below the screening criteria.

PDR summary results are presented in Attachment 1. Weather information (including ambient pressure and temperature data) and high volume air monitoring sample results are presented in Attachment 2. Weather information was collected from the weather station at Building 572, Avenue M, Treasure Island, San Francisco, California. Radiological air monitoring results are presented in Attachment 3.

PM10 analytical results from April 13, 2019 to April 26, 2019 did not exceed the project-specific screening criteria presented in Table 2.

TSP analytical results from April 13, 2019 to April 26, 2019 did not exceed the project-specific screening criteria presented in Table 2, exception for the result for AMS12 on April 24, 2019, which was reported at a delta between the downwind and upwind stations of 250.0 ug/m³. It should be noted that this sample is not representative of a 24-hour period due to equipment malfunction which led to a collection period of less than one hour.

Metals (chromium and lead), PAHs, total PCBs, and dioxin analytical results from April 13, 2019 to April 26, 2019 did not exceed the project-specific screening criteria presented in Table 2.

Dust (PDR) delta action levels did not exceed during the reporting period. The data sheets are found in Attachment 1.

Radiological air monitoring action levels were not exceeded during the reporting period.

6.0 REFERENCES

Gilbane, 2016. *Radiological Procedure PR-RP-150 Radiological Survey and Sampling*. January.

Gilbane, 2018. *Remedial Action/Non-Time Critical Removal Action Work Plan, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California*. September.

Gilbane, 2018. *Remedial Action/Non-Time Critical Removal Action Work Plan, Air Monitoring Report, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California*. September.

Gilbane, 2018. *Remedial Action/Non-Time Critical Removal Action Work Plan, Dust Control Plan, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California*. September.

HERO, 2018. *Dust Action Levels for Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California*. September.

FIGURES



**IR Site 12 Non-SWDA Remedial Action/
SWDA Removal Action**
Former Naval Station Treasure Island
San Francisco, CA

Figure 1
PDR Monitoring Locations
IR Site 32

ATTACHMENTS

ATTACHMENT 1
PDR SUMMARY TABLE AND FIELD FORMS

Table 1-1

Personal Data-logging Real-time (PDR) Aerosol Monitoring Results
Remedial Action/NTCRA IR Site 12
Former Naval Station Treasure Island, San Francisco, California



DustTrak Unit	IR Site	Date	Maximum (mg/m ³)	Average (mg/m ³)	Delta Between Upwind and Downwind stations (mg/m ³)	Below action level? (0.050 mg/m ³) (Yes/No)
DM1	Site 32	4/15/2019	0.020	0.016	NA	NA
DM2	Site 32		0.022	0.016	0.000	Yes
DM3	Site 32		0.023	0.017	0.001	Yes
DM1	Site 32	4/16/2019	0.004	0.003	NA	NA
DM2	Site 32		0.010	0.009	0.006	Yes
DM3	Site 32		0.011	0.008	0.006	Yes
DM1	Site 32	4/17/2019	0.018	0.016	NA	NA
DM2	Site 32		0.026	0.018	0.002	Yes
DM3	Site 32		0.010	0.007	-0.009	Yes
DM1	Site 32	4/18/2019	0.016	0.010	NA	NA
DM2	Site 32		0.024	0.019	0.009	Yes
DM3	Site 32		0.025	0.019	0.009	Yes
DM1	Site 32	4/22/2019	0.035	0.030	NA	NA
DM2	Site 32		0.043	0.033	0.003	Yes
DM3	Site 32		0.040	0.030	0.000	Yes
DM99	Site 12		0.018	0.013	NA	NA
DM100	Site 12		0.035	0.025	0.012	Yes
DM101	Site 12		0.034	0.027	0.014	Yes
DM1	Site 32	4/23/2019	0.040	0.030	NA	NA
DM2	Site 32		0.038	0.029	-0.001	Yes
DM3	Site 32		0.045	0.032	0.002	Yes
DM102	Site 12		0.045	0.033	NA	NA
DM103	Site 12		0.039	0.027	-0.006	Yes
DM104	Site 12		0.035	0.028	-0.005	Yes
DM1	Site 32	4/24/2019	0.040	0.031	NA	NA
DM2	Site 32		0.043	0.033	0.002	Yes
DM3	Site 32		0.034	0.025	-0.007	Yes
DM105	Site 12		0.031	0.029	NA	NA
DM106	Site 12		0.036	0.033	0.004	Yes
DM107	Site 12		0.030	0.030	0.001	Yes
DM1	Site 32	4/25/2019	0.036	0.021	NA	NA
DM2	Site 32		0.045	0.032	0.011	Yes
DM3	Site 32		0.046	0.032	0.011	Yes

Notes:

bold = results above screening criteria

mg/m³ = milligram per cubic meter

NA = not applicable

AIR MONITORING LOG

Client Name NAVFAC

Date 4-15-19

Project No. J310000300

Page 1 of 1

Logged by Mike Cox

Weather

Instrument Type: Dust Trak II

Calibration Standards Used	Factory Calibrated
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AIR MONITORING LOG

Client Name NAVFAC

Date 4/17/19

Project No. J310000300

Page 1 of 1

Logged by Mike Cox

Weather Sunny

Instrument Type: Dust Trak II

Calibration Standards Used	Factory Calibrated
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AIR MONITORING LOG

Client Name NAVFAC

Date 4/22/19

Project No. J310000300

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Logged by Mike Cox

Weather Sunny

Instrument Type: Dust Trak II

Calibration Standards Used Factory Calibrated

Time	Dust Monitoring Station Number	Location	Instrument Reading (mg/m3)	Unit Number	Activities, Remarks
7:26	DM1	UW site 32	0.035	2724	No earth moving activities
↓	DM2	DW site 32	0.043	0943	↓
↓	DM3	DW site 32	0.040	1649	↓
8:50	DM99	UW North point pot holing	0.018	3703	Pre activity reading
↓	DM100	DW N. point pot holing	0.030	2714	↓
↓	DM101	DW N. point pot holing	0.034	2368	↓
9:30	DM99		0.004		pot holing ongoing
↓	DM100		0.023		↓
↓	DM101		0.030		↓
10:15	DM99		0.013		
↓	DM100		0.035		
↓	DM101		0.032		
1:00	DM1		0.025		
↓	DM2		0.023		
↓	DM3		0.025		
1:35	DM99		0.017		
↓	DM100		0.020		
↓	DM101		0.018		
3:30	DM99		0.014		
↓	DM100		0.017		
↓	DM101		0.020		
3:50	DM1		0.029		
↓	DM2		0.033		
↓	DM3		0.025		

AIR MONITORING LOG

Client Name NAVFAC

Date 4/23/19

Project No. J310000300

Page 1 of 1

Logged by Mike Cox

Weather Sunny 58°

Instrument Type: Dust Trak II

Calibration Standards Used Factory Calibrated

Time	Dust Monitoring Station Number	Location	Instrument Reading (mg/m3)	Unit Number	Activities, Remarks
7:20	DM1	UW site 32	0.040	0943	No earth moving activities
↓	DM2	DW site 32	0.038	2724	Building demo ongoing
↓	DM3	DW site 32	0.045	1649	DMC across street from site 32
9:10	DM102	UW potholing North point	0.045	3763	Pre potholing activity reading
↓	DM103	DW potholing North point	0.039	2368	
↓	DM104	DW potholing North point	0.035	2714	↓
11:00	DM1		0.029		
	DM2		0.032		
	DM3		0.029		
11:10	DM102		0.032		Potholing
↓	DM103		0.028		
↓	DM104		0.033		
1:30	DM1		0.035		
	DM2		0.024		
	DM3		0.032		
3:00	DM102		0.022		
↓	DM103		0.014		
↓	DM104		0.016		
4:00	DM1		0.015		
↓	DM2		0.020		
↓	DM3		0.021		

Client Name NAVFAC

Client Name NAVFAC

Project No. J310000300

Date 4/24/19

Page 1 of 1

Logged by Mike Cox

Weather Sunny

Instrument Type: Dust Trak II

Calibration Standards Used Factory Calibrated

[illegible]

[illegible]

ATTACHMENT 2
SUMMARY OF AIR MONITORING AND AIR SAMPLING RESULTS

Table 2-1**Ambient Pressure and Temperature Monitoring Results****Remedial Action/NTCRA IR Site 12****Former Naval Station Treasure Island, San Francisco, California**

Sample Date	Ambient Pressure (inches of Hg)	Ambient Temperature (°F)	Ambient Temperature (K)
4/16/2019	30.09	53.04	284.84
4/17/2019	30.27	54.81	285.82
4/18/2019	30.37	55.05	285.96
4/19/2019	30.24	54.52	285.66
4/23/2019	30.22	58.68	287.97
4/24/2019	30.13	61.85	289.73
4/25/2019	30.12	58.06	287.63
4/26/2019	30.15	54.40	285.59

Notes:

Weather data collected from weather station at Building 572, Avenue M, Treasure Island, San Francisco, CA

°F = Degrees Fahrenheit

Hg = mercury

K = Kelvin

Table 2-2
Particulate Matter Smaller than Ten Microns (PM10)
Remedial Action/NTCRA IR Site 12
Former Naval Station Treasure Island, San Francisco, California



Location ID	Sampling Period (Hours)	Sample Date	Particulate Matter Less Than 10 Microns in Diameter (ug/m ³)	Delta between Downwind and Upwind Stations (ug/m ³)	PM10 Exceedance? (Yes/No)
Screening Criteria					50
AMS01	8.19 *	4/16/2019	40	NA	NA
	23.39	4/17/2019	23	NA	NA
	23.97	4/18/2019	28	NA	NA
	24.19	4/19/2019	19	NA	NA
	23.73	4/23/2019	34	NA	NA
	23.98	4/24/2019	26	NA	NA
	24.16	4/25/2019	41	NA	NA
	25.48	4/26/2019	19	NA	NA
AMS02	23.86	4/16/2019	30	-10	No
	23.53	4/17/2019	29	6	No
	23.65	4/18/2019	44	16	No
	23.24	4/19/2019	39	20	No
	23.67	4/23/2019	47	13	No
	23.29	4/24/2019	37	11	No
	23.87	4/25/2019	36	-5	No
	24.36	4/26/2019	16	-3	No
AMS07	23.37	4/16/2019	30	NA	NA
	23.66	4/17/2019	25	NA	NA
	23.79	4/18/2019	30	NA	NA
	24.71	4/19/2019	19	NA	NA
	23.77	4/23/2019	33	NA	NA
	23.46	4/24/2019	21	NA	NA
	24.00	4/25/2019	29	NA	NA
AMS12	24.26	4/16/2019	19	-11	No
	23.73	4/17/2019	20	-5	No
	23.88	4/18/2019	26	-4	No
	24.46	4/19/2019	17	-2	No
	23.36	4/23/2019	20	-13	No
	0.50 *	4/24/2019	R	NA	NA
	17.34 *	4/25/2019	11	-18	No

Notes:

R = rejected data; result unusable

NA = not applicable

PM10 = particulate matter less than 10 microns in diameter

ug/m³ = microgram per cubic meter

* = PM10 sampler malfunctioned

Table 2-3

Total Suspended Particulates Monitoring Results
Remedial Action/NTCRA IR Site 12
Former Naval Station Treasure Island, San Francisco, California



Location ID	Sampling Period (Hours)	Sample Date	Total Suspended Particulate (ug/m ³)	Delta Between Downwind and Upwind Stations (ug/m ³)	TSP Exceedance? (Yes/No)
Screening Criteria					50
AMS01	8.22	4/16/2019	36.23	NA	NA
	23.39	4/17/2019	32.55	NA	NA
	23.87	4/18/2019	38.78	NA	NA
	24.21	4/19/2019	29.33	NA	NA
	23.73	4/23/2019	58.32	NA	NA
	23.74	4/24/2019	50.61	NA	NA
	24.16	4/25/2019	52.28	NA	NA
	25.48	4/26/2019	41.13	NA	NA
AMS02	23.87	4/16/2019	48.52	12.28	No
	23.50	4/17/2019	49.70	17.15	No
	23.73	4/18/2019	75.42	36.64	No
	23.33	4/19/2019	77.10	47.77	No
	23.83	4/23/2019	73.48	15.16	No
	23.20	4/24/2019	69.11	18.51	No
	23.77	4/25/2019	64.95	12.68	No
	24.28	4/26/2019	74.77	33.64	No
AMS07	23.33	4/16/2019	51.40	NA	NA
	23.82	4/17/2019	29.40	NA	NA
	23.78	4/18/2019	34.33	NA	NA
	24.67	4/19/2019	23.43	NA	NA
	23.80	4/23/2019	46.59	NA	NA
	23.60	4/24/2019	42.52	NA	NA
	23.70	4/25/2019	49.45	NA	NA
AMS12	24.25	4/16/2019	6.92	-44.48	No
	22.46	4/17/2019	30.06	0.66	No
	23.90	4/18/2019	32.05	-2.28	No
	24.46	4/19/2019	27.08	3.64	No
	23.39	4/23/2019	55.06	8.47	No
	0.45 *	4/24/2019	292.5	250.0	Yes
	17.30	4/25/2019	56.06	6.62	No

Notes:

NA = not applicable

TSP = total suspended particulate

bold = results above screening criteria

* = TSP sampler malfunctioned

Table 2-4

Metals by EPA 6020 Monitoring Results

Remedial Action/NTCRA IR Site 12

Former Naval Station Treasure Island, San Francisco, California



Location ID	Sampling Period (Hours)	Sample Date	Lead (ug/m ³)	Lead Exceedance? (Yes/No)	Chromium (ug/m ³)	Chromium Exceedance? (Yes/No)
Screening Criteria				242	929	
AMS01	8.19 *	4/16/2019	0.0021 J	No	0.013	No
	23.39	4/17/2019	0.00073 J	No	0.0043	No
	23.97	4/18/2019	0.00066 J	No	0.0049	No
	24.19	4/19/2019	0.00087	No	0.0046	No
	23.73	4/23/2019	0.0034	No	0.0051	No
	23.98	4/24/2019	0.0013	No	0.0045	No
	24.16	4/25/2019	0.0011	No	0.0011 J	No
	25.48	4/26/2019	0.0018	No	0.004	No
AMS02	23.86	4/16/2019	0.0023	No	0.0051	No
	23.53	4/17/2019	0.0015	No	0.0047	No
	23.65	4/18/2019	0.0026	No	0.0056	No
	23.24	4/19/2019	0.0033	No	0.0058	No
	23.67	4/23/2019	0.0047	No	0.0051	No
	23.29	4/24/2019	0.0027	No	0.0049	No
	23.87	4/25/2019	0.002	No	0.0044	No
	24.36	4/26/2019	0.0028	No	0.0043	No
AMS07	23.37	4/16/2019	0.0028	No	0.0049	No
	23.66	4/17/2019	0.0007 J	No	0.0048	No
	23.79	4/18/2019	0.00068 J	No	0.0045	No
	24.71	4/19/2019	0.00094	No	0.0043	No
	23.77	4/23/2019	0.0033	No	0.0043	No
	23.46	4/24/2019	0.0015	No	0.0045	No
	24.00	4/25/2019	0.0012	No	0.004	No
AMS12	24.26	4/16/2019	0.00069 J	No	0.0043	No
	23.73	4/17/2019	0.00072 J	No	0.0039	No
	23.88	4/18/2019	0.00065 J	No	0.0048	No
	24.46	4/19/2019	0.0013	No	0.0047	No
	23.36	4/23/2019	0.0044	No	0.0048	No
	0.50 *	4/24/2019	0.03 J	No	0.16	No
	17.34 *	4/25/2019	0.0026	No	0.0054	No

Notes:

J = indicates an estimated value

NA = not applicable

ug/m³ = microgram per cubic meter

* = sampler malfunction

Table 2-5
Polycyclic Aromatic Hydrocarbons by TO-13 Monitoring Results
Remedial Action/NTCRA IR Site 12
Former Naval Station Treasure Island, San Francisco, California



Location ID	Sampling Period (Hours)	Sample Date	BAP(Eq) Exceed-ance? (Yes/No)	BAP(Eq)	2-Methyl-naphthalene (ug/m³)	Acenaph-thene (ug/m³)	Acenaph-thylene (ug/m³)	Anthra-cene (ug/m³)	Benzo(a) anthra-cene (ug/m³)	Benzo(a) pyrene (ug/m³)	Benzo(b) fluoran-thene (ug/m³)	Benzo(g,h,i) perylene (ug/m³)	Benzo(k) fluoran-thene (ug/m³)	Chrysene (ug/m³)	Dibenz(a,h) anthra-cene (ug/m³)	Fluoran-thene (ug/m3)	Fluorene (ug/m3)	Indeno (1,2,3-c,d) pyrene (ug/m3)	Naphthalene (ug/m3)	Phenan-threne (ug/m3)	Pyrene (ug/m3)
Screening Criteria ¹				50	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
AMS01	23.90	4/18/2019	No	0	0.011	0.00049	< 0.00047	< 0.00047	< 0.00047	< 0.00047	< 0.00047	< 0.00047	< 0.00047	< 0.00047	< 0.00047	< 0.00047	0.00053	< 0.00047	0.0077	0.0013	< 0.00047
	23.60	4/24/2019	No	0	0.019 J	0.0014 J	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0014 J	< 0.0005	0.012 J	0.0022 J
AMS02	22.91	4/18/2019	No	0	0.0063	0.00075	0.00027 J	0.00021 J	< 0.00047	< 0.00047	< 0.00047	< 0.00047	< 0.00047	< 0.00047	< 0.00047	0.00031 J	0.0011	< 0.00047	0.0091	0.0024	0.00068
	23.25	4/24/2019	No	0	0.013 J	0.0014 J	0.00045 J	0.0002 J	< 0.00049	< 0.00049	< 0.00049	< 0.00049	< 0.00049	< 0.00049	< 0.00049	0.00049 J	0.0015 J	< 0.00049	0.014 J	0.0032 J	0.0012 J
AMS07	23.81	4/18/2019	No	0	0.0018	0.00032 J	< 0.00047	< 0.00047	< 0.00047	< 0.00047	< 0.00047	< 0.00047	< 0.00047	< 0.00047	< 0.00047	< 0.00047	0.00034 J	< 0.00047	0.0046	0.00063	< 0.00047
	23.66	4/24/2019	No	0	0.0043 J	0.00056 J	< 0.00056	< 0.00056	< 0.00056	< 0.00056	< 0.00056	< 0.00056	< 0.00056	< 0.00056	< 0.00056	< 0.00056	0.0006 J	< 0.00056	0.0058 J	0.0011 J	0.00037 J
AMS12	23.90	4/18/2019	No	0	0.0013	0.00016 J	< 0.00038	< 0.00038	< 0.00038	< 0.00038	< 0.00038	< 0.00038	< 0.00038	< 0.00038	< 0.00038	< 0.00038	0.00023 J	< 0.00038	0.0023	0.00044	< 0.00038
	0.33	4/24/2019*	No	0	< 0.054	< 0.027	< 0.027	< 0.027	< 0.027	< 0.027	< 0.027	< 0.027	< 0.027	< 0.027	< 0.027	< 0.027	< 0.027	< 0.027	< 0.054	< 0.027	< 0.027

Notes:

¹ The screening criteria for BAP(Eq) is 50 ug/m³ except for the area surrounding excavation KCH-1217-1 at which it will be 8 ug/m³.

NA = not applicable

ND = Not detected

NE = Not established

BAP(Eq) = Benzo(a) pyrene equivalency

J = estimated value

< = nondetected less than associated reporting limit

* = PUF sampler malfunction

Table 2-6
Polychlorinated Biphenyls by TO-4A Monitoring Results
Remedial Action/NTCRA IR Site 12
Former Naval Station Treasure Island, San Francisco, California



Location ID	Sampling Period (Hours)	Sample Date	Total PCB Exceedance? (Yes/No)	Total PCB	PCB-1016 (Aroclor 1016) (ug/m ³)	PCB-1221 (Aroclor 1221) (ug/m ³)	PCB-1232 (Aroclor 1232) (ug/m ³)	PCB-1242 (Aroclor 1242) (ug/m ³)	PCB-1248 (Aroclor 1248) (ug/m ³)	PCB-1254 (Aroclor 1254) (ug/m ³)	PCB-1260 (Aroclor 1260) (ug/m ³)
Screening Criteria							NE				
AMS01	23.41	4/17/2019	NA	0	< 0.00067	< 0.00067	< 0.00067	< 0.00067	< 0.00067	< 0.00067	< 0.00067
	23.67	4/23/2019	NA	0	< 0.00068	< 0.00068	< 0.00068	< 0.00068	< 0.00068	< 0.00068	< 0.00068
	25.36	4/26/2019	NA	0	< 0.00065	< 0.00065	< 0.00065	< 0.00065	< 0.00065	< 0.00065	< 0.00065
AMS02	23.50	4/17/2019	NA	0	< 0.00067	< 0.00067	< 0.00067	< 0.00067	< 0.00067	< 0.00067	< 0.00067
	23.79	4/23/2019	NA	0	< 0.0013	< 0.0013	< 0.0013	< 0.0013	< 0.0013	< 0.0013	< 0.0013
	24.33	4/26/2019	NA	0	< 0.00067	< 0.00067	< 0.00067	< 0.00067	< 0.00067	< 0.00067	< 0.00067
AMS07	23.84	4/17/2019	NA	0	< 0.00074	< 0.00074	< 0.00074	< 0.00074	< 0.00074	< 0.00074	< 0.00074
	23.77	4/23/2019	NA	0	< 0.00075	< 0.00075	< 0.00075	< 0.00075	< 0.00075	< 0.00075	< 0.00075
AMS12	23.71	4/17/2019	NA	0	< 0.00055	< 0.00055	< 0.00055	< 0.00055	< 0.00055	< 0.00055	< 0.00055
	23.25	4/23/2019	NA	0	< 0.00054	< 0.00054	< 0.00054	< 0.00054	< 0.00054	< 0.00054	< 0.00054

Notes:

NA = Not applicable

NE = none established

PCB = polychlorinated biphenyl

ug/m³ = microgram per cubic meter

< = nondetected less than associated reporting limit

Table 2-7
Dioxin as 2,3,4,7,8-TCDD by TO-9A Monitoring Results
Remedial Action/NTCRA IR Site 12
Former Naval Station Treasure Island, San Francisco, California



Location ID	Sampling Period (Hours)	Sample Date	2,3,7,8-Tetrachlorodibenzo-p-dioxin (ug/m ³)	Dioxin Exceedance? (Yes/No)
Screening Criteria				10,000,000
AMS01	8.23 *	4/16/2019	< 0.00000005	No
	24.12	4/19/2019	< 0.00000002	No
	24.18	4/25/2019	< 0.00000002	No
AMS02	23.87	4/16/2019	< 0.00000002	No
	23.29	4/19/2019	< 0.00000002	No
	23.85	4/25/2019	< 0.00000002	No
AMS07	23.37	4/16/2019	< 0.00000002	No
	24.83	4/19/2019	< 0.00000002	No
	24.29	4/25/2019	< 0.00000002	No
AMS12	24.25	4/16/2019	< 0.0000014	No
	24.47	4/19/2019	< 0.00000001	No
	17.25 *	4/25/2019	< 0.00000002	No

Notes:

* = PUF sampler malfunctioned

ug/m³ = microgram per cubic meter

< = nondetected less than associated reporting limit

ATTACHMENT 3
RADIOLOGICAL AIR MONITORING RESULTS



AIR SAMPLE RESULTS - PUBLIC EXPOSURE MONITORING

Project Information									Effluent Air Concentration					Sampling Period				Color Codes					
Contract / Task Order Number: N62473-17-D-0005		Project Title / Location: IR Site 12 RD/RA, Treasure Island, SF, CA			Gilbane Project Number: J310000300							Alpha	Beta	Air samples collected between April 13, 2019 and April 26, 2019		Value < MDC		Value < 0.1 x Effluent Conc					
									Radionuclide		Ra-226	Sr-90	< 72 hr decay time			Value > 0.1 x Effluent Conc							
									Effluent Conc (µCi/ml)		9.E-13	6.E-12	Data reviewed			Value > Effluent Conc							
Sample Collection									Count Information								Sample Results				Initials		
Sample Number	Sample Type	Sample Location	Equip No	Ave Flow Rate (lpm)	Start Day Time	End Date Time	Elapsed Time (min)	Volume (ml)	Inst No	Count Date	Time (min)	Counting Units	Gross Activity		Net dpm		Activity (µCi/ml)		Effluent Conc (%)		Count Tech	Data Reviewer	
													Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta			
AS-275	Perimeter	AMS-01	PE01	50	4/15/19 7:20	4/15/19 15:50	510	2.5E+07	A	4/22/19	20	cpm	0.300	3.950	0.9	8.3	1.5E-14	1.5E-13	1.7%	2.4%	BS	CB	
AS-276	Perimeter	AMS-02	PE02	60	4/15/19 7:10	4/15/19 15:40	510	3.1E+07	A	4/22/19	20	cpm	0.250	3.000	0.7	5.7	1.1E-14	8.4E-14	1.2%	1.4%	BS	CB	
AS-277	Perimeter	AMS-07	PE03	50	4/15/19 7:30	4/15/19 16:00	510	2.5E+07	A	4/22/19	20	cpm	0.200	2.900	0.6	5.4	1.0E-14	9.6E-14	1.1%	1.6%	BS	CB	
AS-278	Perimeter	AMS-12	PE04	50	4/15/19 7:15	4/15/19 15:55	520	2.6E+07	A	4/22/19	20	cpm	0.200	3.100	0.6	6.0	1.0E-14	1.0E-13	1.1%	1.7%	BS	CB	
AS-279	Perimeter	AMS-01	PE01	50	4/16/19 5:55	4/16/19 15:00	545	2.7E+07	A	4/22/19	20	cpm	0.350	3.950	1.0	8.3	1.7E-14	1.4E-13	1.9%	2.3%	BS	CB	
AS-280	Perimeter	AMS-02	PE02	60	4/16/19 6:05	4/16/19 15:15	550	3.3E+07	A	4/22/19	20	cpm	0.150	4.050	0.4	8.5	5.9E-15	1.2E-13	0.7%	1.9%	BS	CB	
AS-281	Perimeter	AMS-07	PE03	50	4/16/19 6:15	4/16/19 15:30	555	2.8E+07	A	4/22/19	20	cpm	0.150	3.300	0.4	6.5	7.0E-15	1.1E-13	0.8%	1.8%	BS	CB	
AS-282	Perimeter	AMS-12	PE04	50	4/16/19 6:00	4/16/19 15:05	545	2.7E+07	A	4/22/19	20	cpm	0.050	3.200	0.1	6.2	2.4E-15	1.0E-13	0.3%	1.7%	BS	CB	
AS-283	Perimeter	AMS-01	PE01	50	4/17/19 5:55	4/17/19 15:10	555	2.8E+07	A	4/22/19	20	cpm	0.250	3.250	0.7	6.4	1.2E-14	1.0E-13	1.3%	1.7%	BS	CB	
AS-284	Perimeter	AMS-02	PE02	60	4/17/19 5:45	4/17/19 15:20	575	3.4E+07	A	4/22/19	20	cpm	0.250	3.150	0.7	6.1	9.4E-15	8.0E-14	1.0%	1.3%	BS	CB	
AS-285	Perimeter	AMS-07	PE03	50	4/17/19 6:05	4/17/19 15:30	565	2.8E+07	A	4/22/19	20	cpm	0.150	3.950	0.4	8.3	6.9E-15	1.3E-13	0.8%	2.2%	BS	CB	
AS-286	Perimeter	AMS-12	PE04	50	4/17/19 5:50	4/17/19 15:00	550	2.8E+07	A	4/22/19	20	cpm	0.000	4.200	0.0	8.9	0.0E+00	1.5E-13	0.0%	2.4%	BS	CB	
AS-287	Perimeter	AMS-01	PE01	50	4/18/19 5:45	4/18/19 15:40	595	3.0E+07	A	4/22/19	20	cpm	0.150	2.850	0.4	5.3	6.5E-15	8.0E-14	0.7%	1.3%	BS	CB	
AS-288	Perimeter	AMS-02	PE02	60	4/18/19 6:00	4/18/19 15:15	555	3.3E+07	A	4/22/19	20	cpm	0.100	3.900	0.3	8.1	3.9E-15	1.1E-13	0.4%	1.8%	BS	CB	
AS-289	Perimeter	AMS-07	PE03	50	4/18/19 6:10	4/18/19 15:45	575	2.9E+07	A	4/22/19	20	cpm	0.150	3.400	0.4	6.8	6.8E-15	1.1E-13	0.8%	1.8%	BS	CB	
AS-290	Perimeter	AMS-12	PE04	50	4/18/19 5:50	4/18/19 15:30	580	2.9E+07	A	4/22/19	20	cpm	0.200	4.350	0.6	9.3	9.0E-15	1.5E-13	1.0%	2.4%	BS	CB	
AS-291	Perimeter	AMS-01	PE01	50	4/19/19 6:05	4/19/19 12:00	355	1.8E+07	A	4/22/19	20	cpm	0.200	3.200	0.6	6.2	1.5E-14	1.6E-13	1.6%	2.6%	BS	CB	
AS-292	Perimeter	AMS-02	PE02	60	4/19/19 6:15	4/19/19 12:10	355	2.1E+07	A	4/22/19	20	cpm	0.150	4.850	0.4	10.7	9.1E-15	2.3E-13	1.0%	3.8%	BS	CB	
AS-293	Perimeter	AMS-01	PE01	50	4/22/19 7:15	4/22/19 15:55	520	2.6E+07	A	4/29/19	20	cpm	0.200	2.750	0.6	5.0	1.0E-14	8.7E-14	1.1%	1.4%	BS	CB	
AS-294	Perimeter	AMS-02	PE02	60	4/22/19 7:25	4/22/19 16:00	515	3.1E+07	A	4/29/19	20	cpm	0.050	3.650	0.1	7.5	2.1E-15	1.1E-13	0.2%	1.8%	BS	CB	
AS-295	Perimeter	AMS-07	PE03	50	4/22/19 7:30	4/22/19 16:05	515	2.6E+07	A	4/29/19	20	cpm	0.050	3.300	0.1	6.5	2.5E-15	1.1E-13	0.3%	1.9%	BS	CB	
AS-296	Perimeter	AMS-12	PE04	50	4/22/19 7:10	4/22/19 15:50	520	2.6E+07	A	4/29/19	20	cpm	0.050	4.750	0.1	10.4	2.5E-15	1.8E-13	0.3%	3.0%	BS	CB	
AS-297	Perimeter	AMS-01	PE01	50	4/23/19 6:00	4/23/19 15:30	570	2.9E+07	A	4/29/19	20	cpm	0.250	4.450	0.7	9.6	1.1E-14	1.5E-13	1.3%	2.5%	BS	CB	
AS-298	Perimeter	AMS-02	PE02	60	4/23/19 6:10	4/23/19 15:40	570	3.4E+07	A	4/29/19	20	cpm	0.100	4.600	0.3	10.0	3.8E-15	1.3E-13	0.4%	2.2%	BS	CB	
AS-299	Perimeter	AMS-07	PE03	50	4/23/19 6:15	4/23/19 15:05	530	2.6E+07	A	4/29/19	20	cpm	0.200	3.600	0.6	7.3	9.8E-15	1.2E-13	1.1%	2.1%	BS	CB	
AS-300	Perimeter	AMS-12	PE04	50	4/23/19 5:55	4/23/19 15:10	555	2.8E+07	A	4/29/19	20	cpm	0.250	3.000	0.7	5.7	1.2E-14	9.2E-14	1.3%	1.5%	BS	CB	
AS-301	Perimeter	AMS-01	PE01	50	4/24/19 6:00	4/24/19 15:15	555	2.8E+07	A	4/29/19	20	cpm	0.050	3.800	0.1	7.9	2.3E-15	1.3E-13	0.3%	2.1%	BS	CB	
AS-302	Perimeter	AMS-02	PE02	60	4/24/19 5:50	4/24/19 15:30	580	3.5E+07	A	4/29/19	20	cpm	0.150	3.400	0.4	6.8	5.6E-15	8.8E-14	0.6%	1.5%	BS	CB	
AS-303	Perimeter	AMS-07	PE03	50	4/24/19 6:10	4/24/19 15:00	530	2.6E+07	A	4/29/19	20	cpm	0.100	4.450	0.3	9.6	4.9E-15	1.6E-13	0.5%	2.7%	BS	CB	
AS-304	Perimeter	AMS-12	PE04	50	4/24/19 5:55	4/24/19 14:55	540	2.7E+07	A	4/29/19	20	cpm	0.250	4.450	0.7	9.6	1.2E-14	1.6E-13	1.3%	2.7%	BS	CB	



AIR SAMPLE RESULTS - PUBLIC EXPOSURE MONITORING

Project Information									Effluent Air Concentration					Sampling Period				Color Codes					
Contract / Task Order Number: N62473-17-D-0005		Project Title / Location: IR Site 12 RD/RA, Treasure Island, SF, CA			Gilbane Project Number: J310000300							Alpha	Beta	Air samples collected between April 13, 2019 and April 26, 2019				Value < MDC		Value < 0.1 x Effluent Conc			
									Radionuclide			Ra-226	Sr-90					< 72 hr decay time		Value > 0.1 x Effluent Conc			
									Effluent Conc (µCi/ml)			9.E-13	6.E-12					Data reviewed		Value > Effluent Conc			
Information effective as of: 5/24/2019																							
Sample Collection									Count Information								Sample Results				Initials		
Sample Number	Sample Type	Sample Location	Equip No	Ave Flow Rate (lpm)	Start Day Time	End Date Time	Elapsed Time (min)	Volume (ml)	Inst No	Count Date	Time (min)	Counting Units	Gross Activity		Net dpm		Activity (µCi/ml)		Effluent Conc (%)		Count Tech	Data Reviewer	
													Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta			
AS-305	Perimeter	AMS-01	PE01	50	4/25/19 5:59	4/25/19 15:17	558	2.8E+07	A	4/29/19	20	cpm	0.350	4.500	1.0	9.8	1.6E-14	1.6E-13	1.8%	2.6%	AO	CB	
AS-306	Perimeter	AMS-02	PE02	60	4/25/19 6:05	4/25/19 15:10	545	3.3E+07	A	4/29/19	20	cpm	0.200	3.950	0.6	8.3	7.9E-15	1.1E-13	0.9%	1.9%	AO	CB	